New Species of *Cyclanthera* (Cucurbitaceae) from Mexico and Central America

C. Eugene Jones
Department of Biological Science, California State University, Fullerton, California 92634, U.S.A.

Denis M. Kearns
Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A.

ABSTRACT. Five new species of *Cyclanthera* are here described: *C. cogniauxii* from the Central Cordillera of Costa Rica; *C. dieterleana* from Durango, Mexico; *C. dioscoreoides* with a disjunct distribution in México, Mexico, and Suchitepéquez, Guatemala; *C. entata* from Chiapas, Mexico; and *C. heiseri* from Durango, Sinaloa, and Jalisco in Mexico.

Cyclanthera Schrader, a distinctive genus of New World cucurbits in the tribe Cyclanthereae, can be easily recognized either by its single, unfolded horizontal ringlike theca or by its oblique, explosively dehiscent capsular fruits. At dehiscence, the seeds are thrown by a catapult-like placental arm. Similar explosively dehiscent fruits are found in the closely related *Elateriopsis* Ernst, *Hanburia* Seemann, *Pseudocyclanthera* Martinez Crovetto, and *Rytidostylis* Hooker & Arnott. *Cyclanthera* is a moderate-sized genus as far as the Cucurbitaceae is concerned, including 35–40 species of small annual herbaceous vines. Study of collections in the course of preparing a monograph of the genus has brought to light five new species from Mexico, Guatemala, and Costa Rica, which are here described.

Cyclanthera cogniauxii C. E. Jones & Kearns, sp. nov. TYPE: Costa Rica. Cartago: 12 km S of Tapantí, beside bridge over Río Grande de Orosí, 6 Apr. 1969, 1,500 m, *Lent 1573* (holotype, F 1703275). Figure 1.

Folia plus minusve 5–7 lobata; glandulae ad basim folii laminae 2–6 parvulae; inflorescentiae masculae folia superantes; pedunculus communis masculus inventus solum ad superum ⅓ florifer; corolla virella.

Stem nodes pubescent to tomentose. Petioles glabrous to puberulent, 10–30 mm long. Leaves broadly ovate to orbicular, somewhat 5- or 7-lobed, 4–12 × 5–12 cm, the central lobe triangular, 2–5 × 3–7 cm, lateral lobes similar, becoming progressively smaller, the margins denticulate to coarsely dentate; upper surface glabrous, with veins glabrous to puberulent especially at juncture of petiole and base of leaf; lower surface completely glabrous; glands at base of leaf blade 2–6, very small. Tendrils bifid. Male inflorescences elongated, few-flowered, racemes or panicles, 6–16 cm long, often longer than the leaves, with flowers confined to upper ⅓ of peduncle or less; pedicels glabrous to puberulent, 2–5 mm long; calyx tube 4–4.5 mm wide; calyx teeth 5, very small to 1 mm long; corolla greenish white, 7–10 mm wide; petals 5, 3-nerved, 2–3 × 2–3 mm; anther capitulum 2–3 mm wide; column 2–2.25 mm long; pollen pentacolporate, 75–80 μm diam. Peduncles of female flowers 6–10 mm long; style 1.5–2 mm long; stigma 1.5–2 mm wide; ovary lanceolate to ovate, 3–4 × 2–2.5 mm, the apex acuminate, with beak 1.5–2 mm; ovules 3–5. Fruiting peduncles 2.5–7 cm; fruit 15–20 × 10–15 mm, the apex blunt; setae many, over entire fruit, 1–6 mm long; placenta 5–7 mm long. Seeds 7–8 × 4–5 × 1–1.5 mm.

Cyclanthera cogniauxii is found in Costa Rica along the Central Cordillera at elevations between 1,500 and 2,500 m. It is quite distinct and appears to be only distantly related to *C. steyermarkii* Standley and *C. monticola* Gentry. It can be readily separated from the former by the presence of glands at the base of the leaf blade and by the position of the male flowers along the male inflorescence. It can be separated from the latter by the much longer male inflorescence, much larger male flowers, and by the presence of glands at the base of the leaf blade. *Cyclanthera cogniauxii* is named for the eminent nineteenth-century authority on the family Cucurbitaceae and former monographer of the genus *Cyclanthera*, Celestin Alfred Cogniaux (1877).

Paratypes. COSTA RICA. **Alajuela:** "La Palma" de San Ramón, 21–23 Aug. 1927, *Brenes 5691* (F); between Finca La Selva y San Rafael de Vara Blanca, N slope Barva, 1,740 m, 23 June 1963, *Jiménez 834* (F);

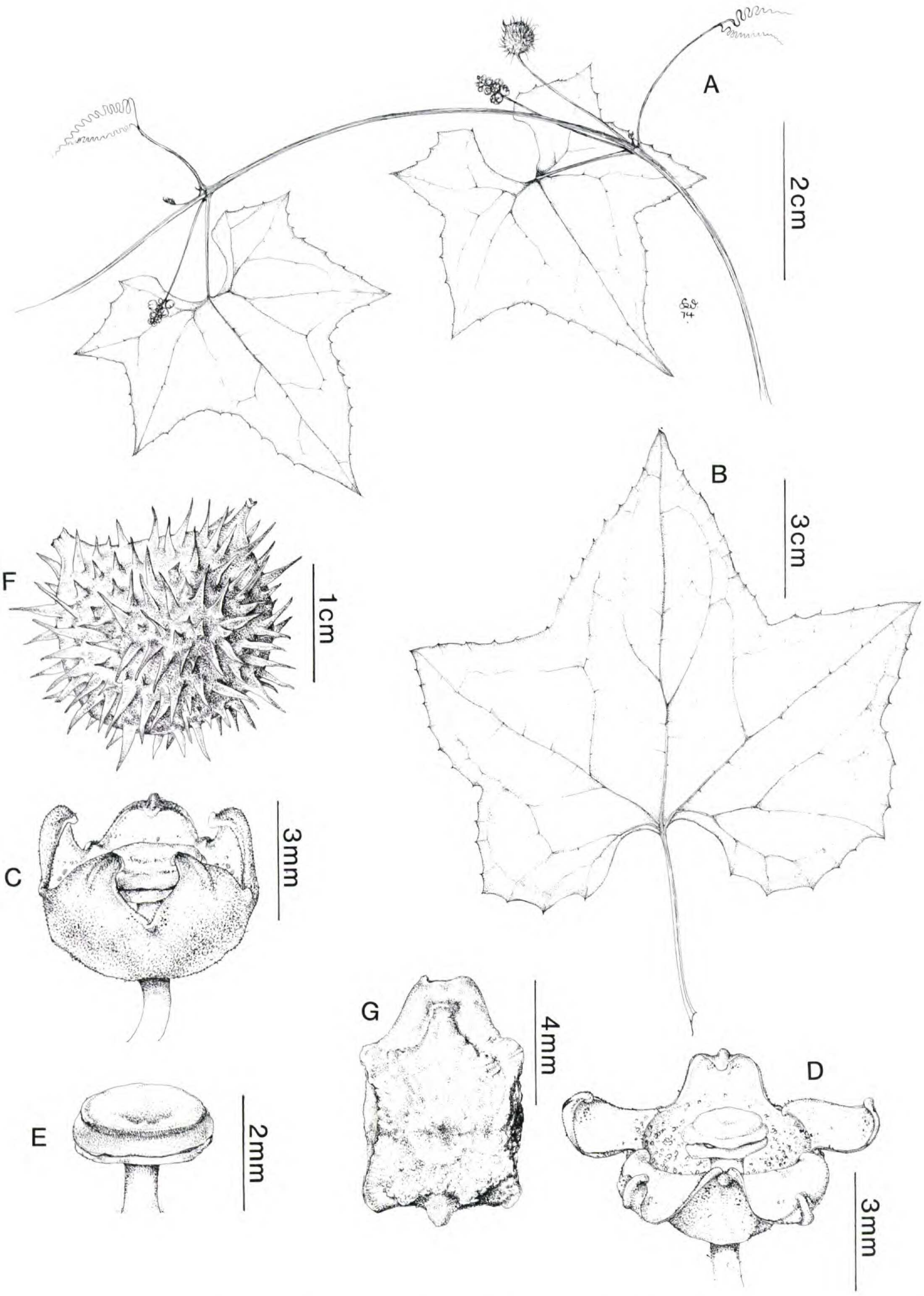

Figure 1. *Cyclanthera cogniauxii* C. E. Jones & Kearns. —A. Habit. —B. Leaf. —C. Male flower, slightly opened. —D. Male flower with petals pulled open. —E. Androecium. —F. Fruit. —G. Seed. Drawn from *Brenes 5691* (B), *Lent 558* (A), *Lent 1573* (F, G), *Williams et al. 28154* (C, D, E).

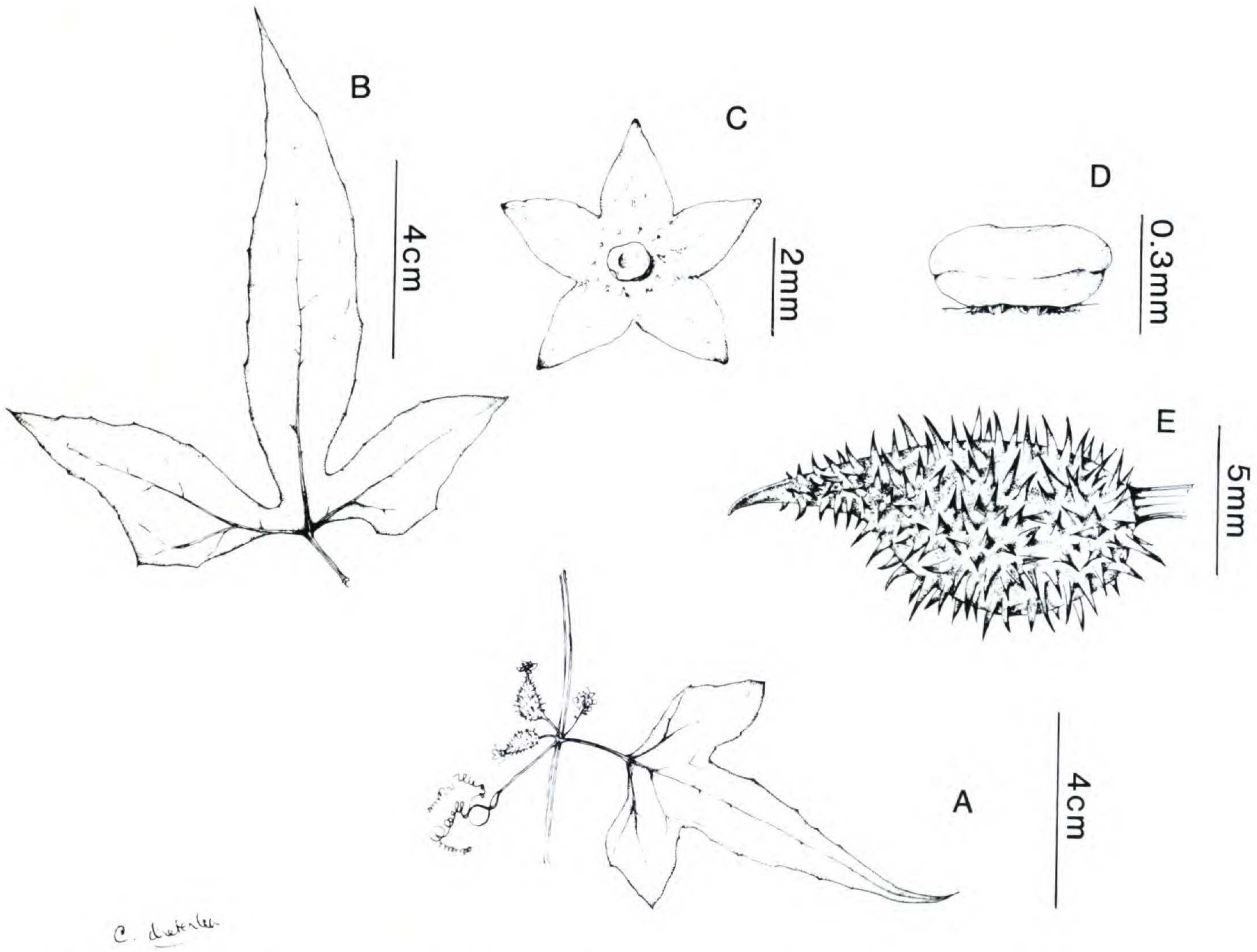

Figure 2. *Cyclanthera dieterleana* C. E. Jones & Kearns. —A. Habit. —B. Leaf. —C. Male flower. —D. Androecium. —E. Fruit. Drawn from *Dieterle 3826*.

Zarcero, La Briss de Zarcero, 2,300 m, 4 Mar. 1938, *Smith H-386* (F); Viento Fresco, 1,600–1,900 m, 13 Feb. 1926, *Standley & Torres R. 47860* (US). **Cartago:** 2 km NW of Trinidad on road up Volcán Turrialba, 1,900 m, 1 May 1965, *Lent 558* (F); La Estrella, 26–27 Mar. 1924, *Standley 39351* (US); La Sierra, ca. 25 km S of Cartago, Cordillera de Talamanca, 2,000 m, 23 Jan. 1965, *L. O. Williams et al. 28154* (F); Vara Blanca de Sarapiquí, N slope of Central Cordillera, 1,500–1,700 m, July–Sep. 1937, *Skutch 3258* (GH, K, MO); S of Vara Blanca on road to San Miguel, 1,900 m, 2 July 1985, *Hammel & Grayum 14098* (MO); Los Cartagos, 2,200 m, 16 Apr. 1963, *Skutch 5480* (F). **San José:** near Río Cascajal, Las Nubes, Coronado, 1,525 m, 10 Apr. 1963, *Jiménez 617* (F); between La Estrella and Copey Hasta, 2,450 m, 15 Feb. 1935, *Valerio 1167* (F).

Cyclanthera dieterleana C. E. Jones & Kearns, sp. nov. TYPE: Mexico. Durango: ca. 45 km SW from La Ciudad, along the main highway between Torreón and Mazatlán, 2,250 m, 21–22 Oct. 1971, *Dieterle 3826* (holotype, MICH). Figure 2.

Folia profunde vel non profunde 3-lobata; glans ad basim folii laminae nulla; inflorescentiae masculae folia breviores; pedunculus communis masculus usque ad basim florifer; corolla flavo-virens.

Stem nodes puberulent. Petioles glabrous, 3–20 mm long. Leaves broadly triangular to ovate, shallowly or deeply 3-lobed, 4–11 × 2.5–11 cm; central lobe narrowly lanceolate, 3–9 × 6–25 mm; lateral lobes similar, somewhat secondarily lobed, 0.7–6 × 5–25 mm; margins sparingly denticulate; upper surface glabrous, with veins glabrous to puberulent especially at juncture of petiole and base of leaf blade; lower surface completely glabrous; glands at base of leaf blade none. Tendrils bifid. Male inflorescences very short, few-flowered racemes, 4–10 mm long, shorter than the petiole, flowering to base of peduncle; pedicels glabrous, 1–3 mm long; calyx tube 0.75 mm wide; calyx teeth none; corolla greenish yellow, 2.5–3.5 mm wide; petals 5, 1- to slightly 3-nerved, 0.5–1.25 × 0.5–1 mm; anther capitulum 0.5 mm wide, sessile; pollen tetracolporate, 55–63 μm diam. Peduncles of female flowers 1–2 mm long; stigma 0.75–1 mm wide, sessile; ovary lanceolate to ovate, 2–2.5 × 1–1.5 mm, the apex acuminate, with beak 1–1.5 mm; ovules 3–4. Fruiting pedun-

cles 4–7 mm; fruit 10–15 × 6–7 mm, the apex acuminate, with beak 1–1.5 mm; setae many, over entire fruit, 1–3 mm long; placenta 7–8 mm long. Seeds 5.5–6 × 3.5–4 × 1–1.5 mm.

Known only from two collections from the states of Durango and Chihuahua, Mexico, at 1,800–2,250 m. *Cyclanthera dieterleana* appears to be related to *C. rostrata* (P. G. Wilson) Kearns & C. E. Jones and *C. heiseri*, from which it is readily separated by having shallowly or deeply 3-lobed leaves instead of 3 primary leaflets. *Cyclanthera dieterleana* also seems to be closely related to *C. dioscoreoides*, from which it is easily separated by the position of the male flowers along the peduncle of the inflorescence, the length of the male inflorescence, and the shallowly or deeply 3-lobed versus nonlobed leaves. This species is named in honor of Jennie Van Akkeren Dieterle, the collector of the type, a specialist in New World Cucurbitaceae and author of the family for the *Flora of Guatemala* (Dieterle, 1976).

Paratype. MEXICO. **Chihuahua:** Municipio Ocampo, Parque Nacional de Cascada Basaseachi, in canyon along Río Candamena leading to falls, 1,800 m, 16 Oct. 1986, *Spellenberg et al. 8772* (NMC, TEX).

Cyclanthera dioscoreoides C. E. Jones & Kearns, sp. nov. TYPE: Mexico. México: ca. 8 km NE of San Bartolo along road between Toluca and Valle de Bravo, deep moist gorge of a creek, ca. 2,600 m, 20 Nov. 1971, *Dieterle 4200* (holotype, MICH). Figure 3.

Folia ovata ad triangularia; glans ad basim folii laminae nulla; inflorescentiae masculae petioli superantes; pedunculus communis masculus inventus solum ad superum ½ florifer; corolla nivea.

Stem nodes glabrous to puberulent. Petioles glabrous, 1–20 mm long. Leaves ovate to triangular, not lobed, 1–5.5 × 1–5.5 cm, the margins denticulate; upper surface glabrous, the veins glabrous to somewhat puberulent at juncture of petiole and base of leaf blade; lower surface completely glabrous; glands at base of leaf blade none. Tendrils simple or bifid. Male inflorescences of short to elongate, few-flowered racemes or panicles, 1–5 cm long, longer than the petioles, with flowers confined to upper ½ of peduncle or less; pedicels glabrous, 0.5–3 mm long; calyx tube 1 mm wide; calyx teeth none; corolla whitish, 2.5–3 mm wide; petals 5, 1-nerved, 0.75–1 × 0.75–1 mm; anther capitulum 0.25–0.5 mm wide, nearly sessile to column of 0.25 mm; pollen tetra- or pentacolporate, 50–55 μm diam. Peduncles of female flowers 0.5–1.5 mm long; style nearly sessile to 0.25 mm long; stigma 0.5–0.75 mm wide; ovary lanceolate, 1.5–2 × 1–1.5 mm, the apex long acuminate, with beak 1–2 mm; ovules 3–4. Fruit 5–7 × 2 mm; apex long acuminate, with beak 4–5 mm; setae few, primarily confined to adaxial surface, 0.1–0.25 mm long; placenta 0.5–1 mm long. Seeds 3–4 × 3–3.5 × 0.5 mm.

Cyclanthera dioscoreoides is known only from two collections: one from Mexico at 2,600 m and the other from Guatemala at 1,200–1,300 m. The two widely separated populations may represent distinct subspecies, but a clear understanding will only be possible with access to additional specimens. The species appears to be most closely related to *C. dieterleana*, under which see discussion. The specific epithet refers to the superficial resemblance of the plant to some species of the genus *Dioscorea* L.

Paratypes. GUATEMALA. **Suchitepéquez:** SW lower slopes of Volcán Zunil along Río Samalá, in vicinity of Finca Montecristo, SE of Santa María de Jesús, 1,200–1,300 m, 31 Jan. 1940, *Steyermark 35196* (F, US).

Cyclanthera entata C. E. Jones & Kearns, sp. nov. TYPE: Mexico. Chiapas: Mpio. of San Cristóbal de Las Casas, ca. 9 mi. SE of San Cristóbal de Las Casas, SW of hwy. 190 near Rancho Nuevo, 9,000 ft., 20 Aug. 1966, *Breedlove 15135* (holotype, CAS; isotypes, K, F specimen not located). Figure 4.

Folia vadose 3-lobata; glans ad basim folii laminae nulla; inflorescentiae masculae petioli superantes; pedunculus communis masculus inventus solum ad superum ⅓ florifer; corolla alba.

Stem nodes puberulent. Petioles glabrous, 3.7–6 cm long. Leaves broadly ovate, very shallowly 3–5-angled, the blade 5–6 × 5–6.5 cm, the margins finely denticulate; upper surface glabrous; lower surface nearly glabrous, with scattered papillae (< 0.2 mm long) and slightly puberulent at junction of leaf veins and petiole; glands at base of leaf blade none. Tendrils bifid. Male inflorescences of short racemes, occasionally compound with some few-flowered branches below, 2–6 cm long, longer than the petioles, with flowers restricted to upper ⅓ of peduncle; peduncles glabrous, 35–50 mm; calyx tube 0.8 mm wide; calyx teeth < 0.1 mm; corolla white, 1–1.5 mm wide; petals 5, 1-nerved, 0.8 × 0.6 mm; anther capitulum ca. 0.3 mm wide, sessile; pollen characters uncertain. Peduncles of female flowers essentially sessile; stigma and style measurements uncertain; ovary elliptic to lanceolate, 1–1.6 × 0.8 mm, the apex attenuate, with beak 1–1.6 mm; ovules 1. Fruiting peduncles elongating during maturation to 25–37 mm; fruit 6 × 5–6 mm, the apex acuminate, with beak 2.4–3.2 mm; setae few, primarily

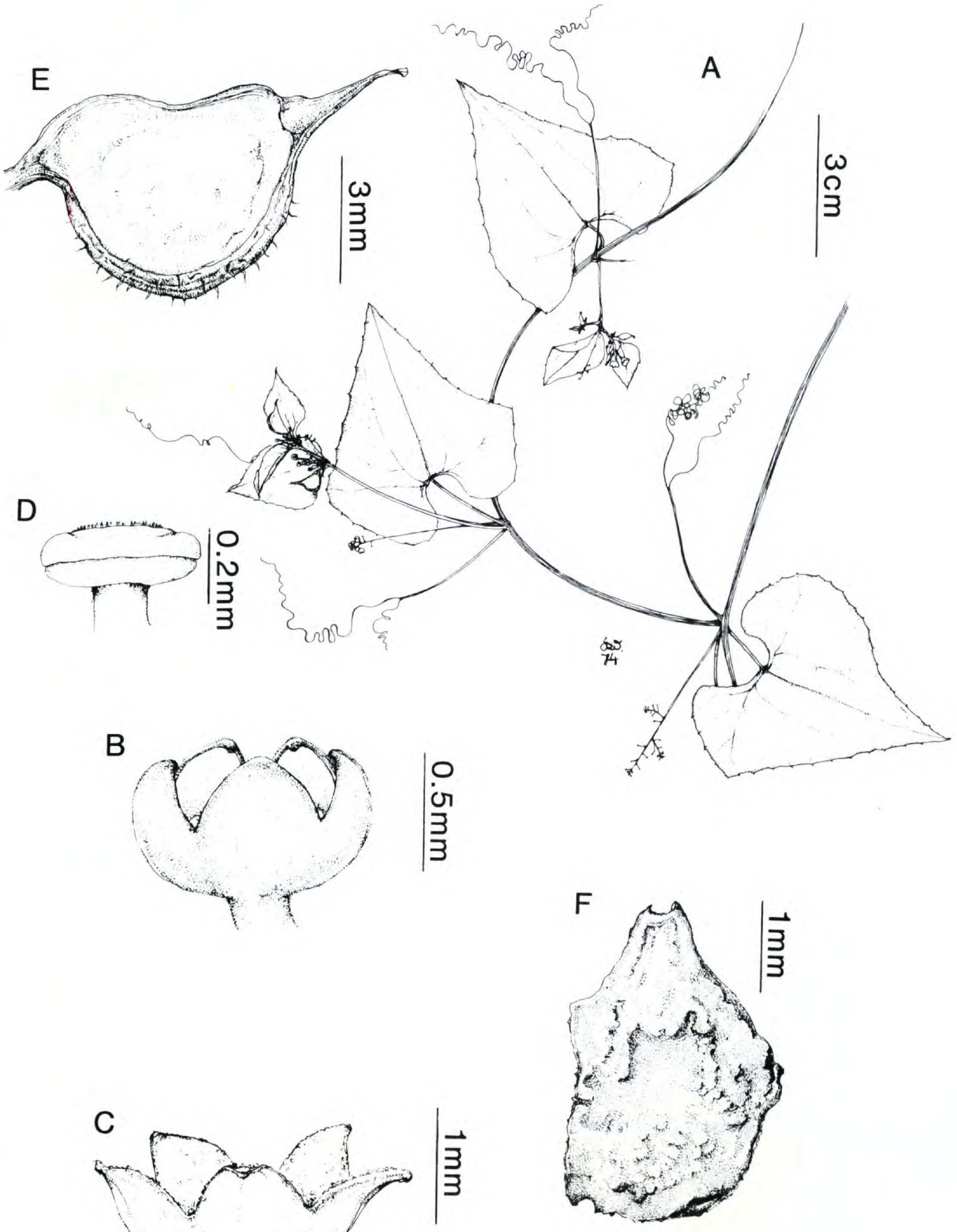

Figure 3. *Cyclanthera dioscoreoides* C. E. Jones & Kearns. —A. Habit. —B. Male flower bud, slightly open. —C. Male flower, open. —D. Androecium. —E. Fruit. —F. Seed. Drawn from *Dieterle 4200*.

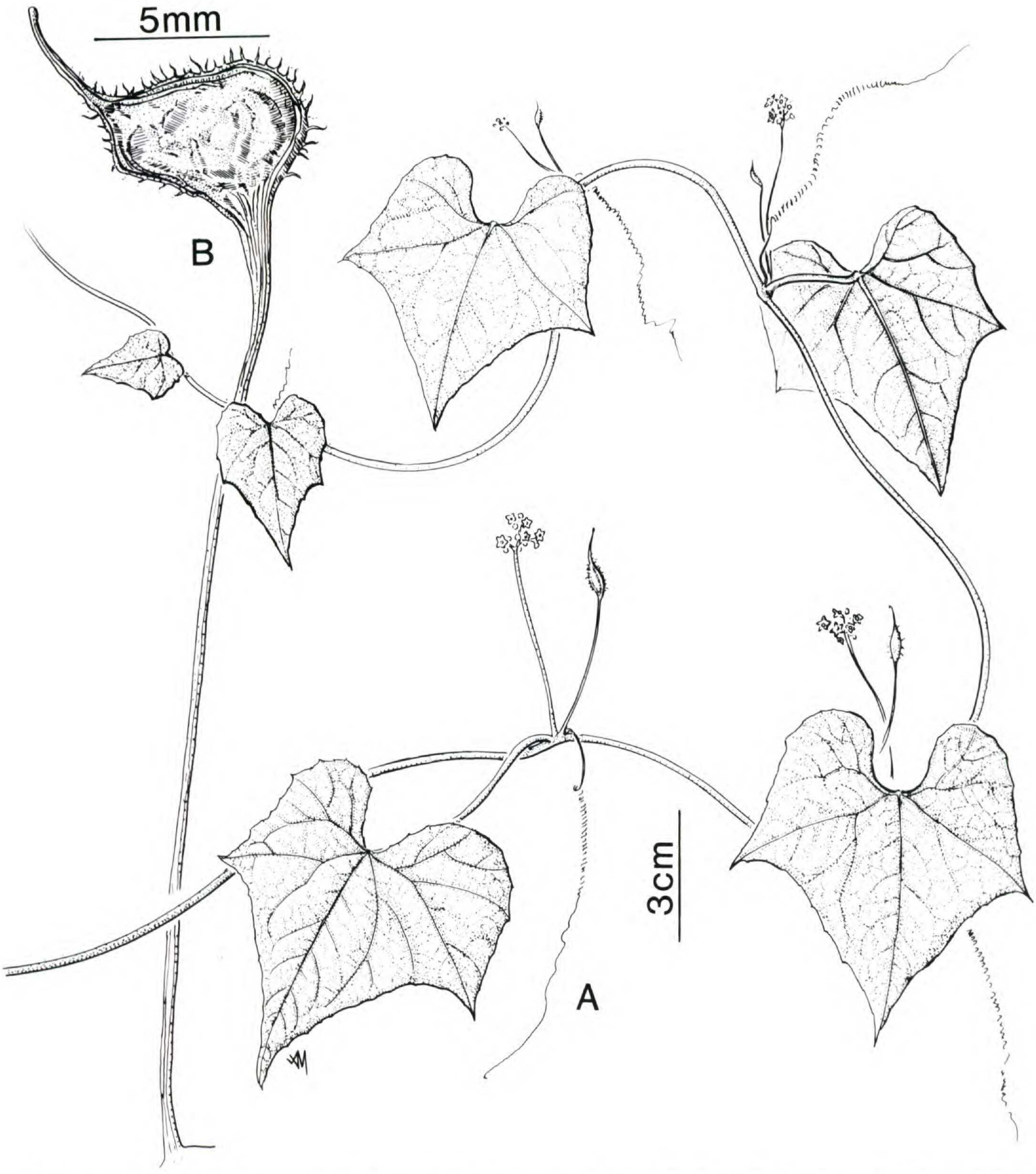

Figure 4. *Cyclanthera entata* C. E. Jones & Kearns. —A. Habit. —B. Fruit. Drawn from *Breedlove 15135*.

confined to adaxial surface, 0.3–0.6 mm; placenta length uncertain. Seeds 5.5 × 3.5 × 1 mm.

Cyclanthera entata is similar to *C. rostrata*, but the two species can be easily differentiated. The leaves of *C. entata* are simple with shallow lobes in contrast to the trifoliolate leaves of *C. rostrata*. In addition, the fruits tend to be more square in *C. rostrata*, while those of *C. entata* have more setae on the margins. The specific epithet refers to the post-anthesis expansion of the petiole, a character also found in some other species of *Cyclanthera*. *Cyclanthera entata* is *Cremastopus* P. Wilson sp. 3 of Jeffrey (1978; Kearns & Jones, 1992) and known only from the type collection.

Cyclanthera heiseri C. E. Jones & Kearns, sp. nov. TYPE: Mexico. Durango: ca. 45 km SW from La Ciudad, along the main highway between Torreón and Matzatlán, seepage area on rock face along road, ca. 2,250 m, 21–22 Oct. 1971, *Dieterle 3825* (holotype, MICH). Figure 5.

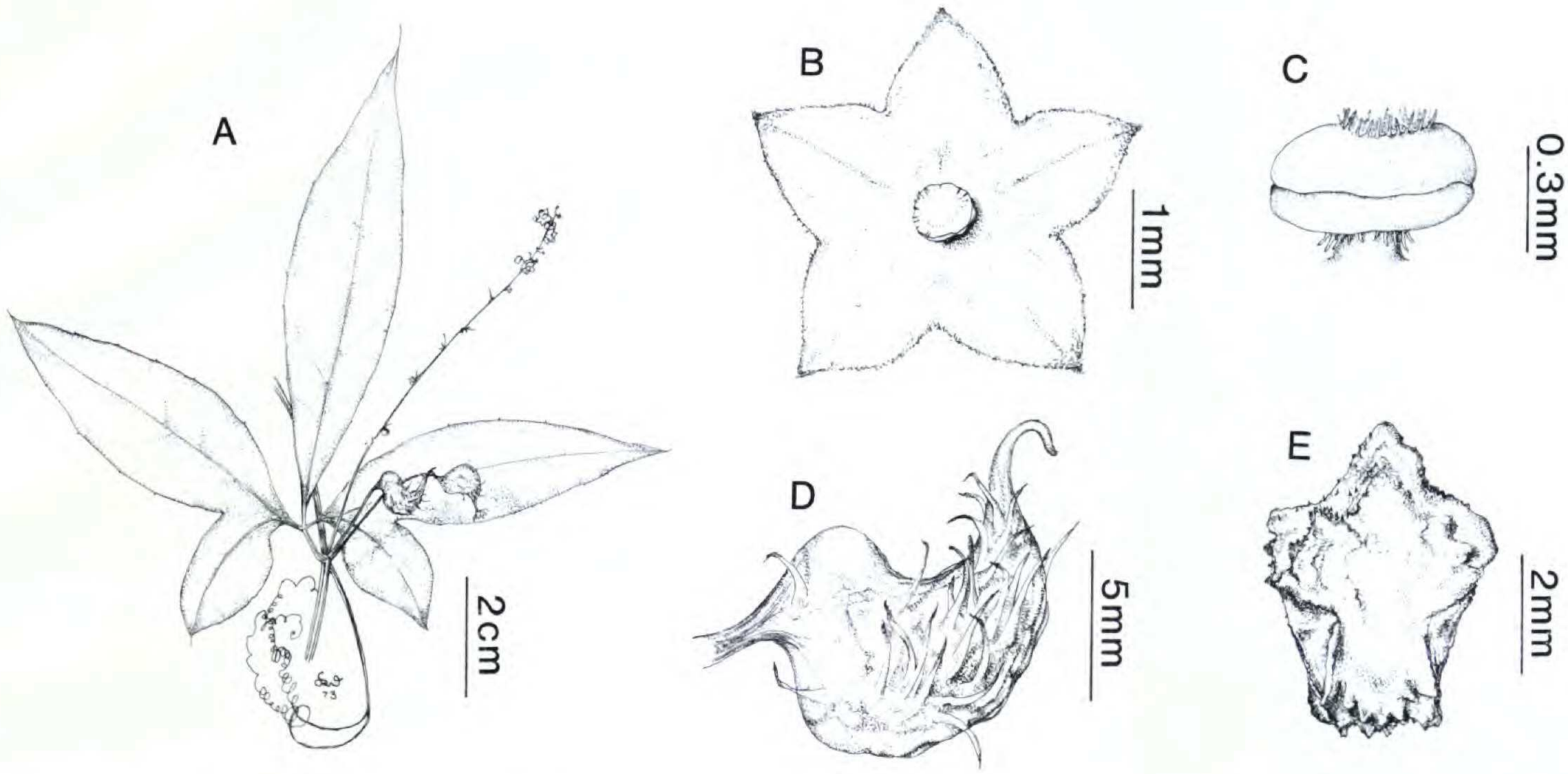

Figure 5. *Cyclanthera heiseri* C. E. Jones & Kearns. —A. Habit. —B. Male flower. —C. Androecium. —D. Fruit. —E. Seed. Drawn from *Dieterle 3825*.

Folia trifoliolata; glans ad basim folii laminae nulla; inflorescentiae masculae petioli superantes; pedunculus communis prope ad basim florifer; corolla virella.

Stem nodes puberulent. Petioles glabrous, 5–45 mm long. Leaves broadly ovate to orbicular, trifoliolate, 1.5–9 × 1.5–9 cm; central leaflet elliptical, 1–7.5 × 0.3–2 cm; blade of lateral leaflets similar, ± bi- or trisect, 1–6 × 0.3–2 cm, the segments of each lateral leaflet becoming progressively smaller, the margins denticulate; upper surface glabrous, the veins puberulent, especially at juncture of leaflets; lower surface completely glabrous; glands at base of leaf blade none. Tendrils bifid. Male inflorescences of elongate, few-flowered racemes or panicles, 1–8 cm long, flowering nearly to base of peduncle; pedicels glabrous, 0.5–3 mm long; calyx tube 0.5–1 mm wide; calyx teeth none; corolla greenish white, 1.5–4 mm wide; petals 5, 1- to slightly 3-nerved, 0.5–1.25 × 0.25–1.5 mm; anther capitulum 0.5–0.75 mm wide; column nearly sessile to 0.25 mm long; pollen tetracolporate, 49–52 μm diam. Peduncles of female flowers 1–3 mm long; style 0.1–0.25 mm long; stigma 0.75–1 mm wide; ovary lanceolate, 2–3 × 1–2 mm, the apex long acuminate, with beak 1.5–4 mm; ovules 2–4. Fruiting peduncles 0.2–2 cm; fruit 5–10 × 5–6 mm; apex long acuminate, with beak 5–6 mm; setae few to many over entire fruit, 0.5–3.5 mm long; placenta 3–6 mm long. Seeds 4–5 × 3.5–4 × 0.75–1 mm.

This species is known in Mexico from single collections from the states of Durango, Jalisco, and Sinaloa at elevations between 900 and 2,250 m. *Cyclanthera heiseri* appears to be most closely related to *C. rostrata* and *C. dieterleana*. Although *C. heiseri* was collected in exactly the same locality and at exactly the same time as *C. dieterleana*, it is quite distinct from the latter. *Cyclanthera heiseri* differs from *C. rostrata* by having lobed lateral leaflets and fruits with 2–4 seeds rather than 1 (rarely 2) seeds. *Cyclanthera heiseri* differs from *C. dieterleana* by having pedately trifoliolate and not simply three-lobed leaves. This species is named in honor of Charles Bixler Heiser, Jr., prominent biosystematist, ethnobotanist, writer, and cucurbit expert.

Paratypes. MEXICO. **Jalisco:** near Etzatlán, 2 Oct. 1903, *Rose & Painter 7568* (US). **Sinaloa:** 30–31 km NE of Concordia, along the main highway between Durango and Mazatlán, ca. 900 m, 22–23 Oct. 1971, *Dieterle 3844* (MICH).

Acknowledgments. We thank Rogers McVaugh for his kind assistance during the senior author's sojourn at MICH. The illustrations are the work of Karen Douthit (Figs. 1, 2, 3, 5) and John Myers (Fig. 4). We also thank the curators and staff at CAS, F, GH, K, MICH, MO, NMC, TEX, and US for the loan of material or for allowing us to examine their collections.

Literature Cited

Cogniaux, C. A. 1877. *Cyclanthera. In:* Diagnoses de Cucurbitacées Nouvelles et Observations sur les Es-

pèces Critiques. Mém. Couronnés Autres Mém. Acad. Roy. Sci. Belgique 28: 61–81.
Dieterle, J. V. A. 1976. Cucurbitaceae. *In:* Flora of Guatemala. Fieldiana, Bot. 24: 306–395.
Jeffrey, C. 1978. Further notes on the Cucurbitaceae: IV, some New World taxa. Kew Bull. 33: 347–380.
Kearns, D. M. & C. E. Jones. 1992. A re-evaluation of the genus *Cremastopus* (Cucurbitaceae). Madroño 39: 301–303.